



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

STEPHEN B. AUGER

Serial No.: 08/865,419

Art Unit: 1751

Filed: May 28, 1997

Examiner: C. Liott

For: MINERAL STAINS FOR WOOD AND OTHER SUBSTRATES

APPEAL BRIEF

To the Commissioner of Patents and Trademarks

Sir:

REAL PARTY IN INTEREST

The above-identified Applicant is the real party in interest in this case.

RELATED APPEALS AND INTERFERENCES

No other related Appeals and Interferences are pending.

STATUS OF CLAIMS

Claims 1-10, 20-22, and 30-36 were finally rejected over the art of record.

Claims 23, 25, 26, and 29, which were withdrawn from consideration have been cancelled. Claims 11-19, 24, 27, and 28 have also been cancelled.

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A copy of the appealed claims is appended hereto in the Appendix.

STATUS OF AMENDMENTS

No amendments were filed after the final rejection.

SUMMARY OF THE INVENTION

The invention (Specification pages 8-17) is a two-step process involving a non-toxic, water-based mineral solution and a low toxicity water-based oxidizing solution applied sequentially to unfinished wood products. The process may be adapted for the coloring and finishing of woodlike products such as bamboo or rattan, paper, recycled cellulose products, cotton and other cloths, leather, certain porous plastics, tile, cement, and other masonry, and other substrate substances.

The user first brushes, sprays, or otherwise applies a water-based solution "A" onto a wood or other product, lets the product dry for about 5-30 minutes, depending on temperature and humidity, then applies a second water-based solution "B". Color change begins immediately and when the B solution dries, in another approximately 5-30 minutes, the product is permanently stained. The solutions may also be applied by soaking the substrate in the solution, at standard temperature and pressure or at either extreme or combinations as with typical pressure treatments for lumber to ensure thorough penetration of thicker substrates.

The process simulates the look of other, generally more expensive woods (i.e. making pine look like maple, alder look like walnut, or bamboo plywood look like oak). In particular, the coloring process provides stains that simulate increasingly endangered woods such as mahogany, ebony, and redwood.

The process can also give new wood an aged appearance for aesthetic reasons, or to allow the unobtrusive introduction of new wood into antique furniture, architectural antiques, fences or shingles that are in need of refurbishment. Staining is uniform, that is, more even than conventional water-based stains.

The A solutions contain a variety of mineral salts (such as a variant of the iron-rich compounds found in nutritional supplements) and other natural compounds that soak into the wood surface readily. The B solutions contain an oxidizing agent, such as dilute peroxides similar to the hydrogen peroxide found in many medicine cabinets. Preferred B solutions are somewhat more concentrated.

The oxygen source causes an oxidation reaction, bonding the minerals in solution A to or among the cellulose fibers in the wood, or other matrix material of a substrate, a process referred to here as "crosslinking." The chemical nature of the crosslinking reaction is suggested by the fact that a color change results from the combination of solution A, solution B, and the substrate. The resulting color, unlike the clear solutions and their components, is not water-soluble.

The process involves saturating the fibers of a wood or other product matrix with a solution of minerals in a water-soluble form and then oxidizing said minerals in the fibers or matrix to change the color, texture, and general appearance of the wood or other properties. The coloring process renders mineral salts into a stable, insoluble form, perhaps an oxide, coordination compound, or other water-insoluble compound or complex, referred to here as a cross linked compound.

The metal salt formulation soaks into the substrate, impregnating it with mineral ions, which are then converted by the oxygen source into an insoluble coloring compound. Thus, a metal oxide may serve as a metal salt if it is solubilized with an acid, applied so as to penetrate into a substrate, and then reacted with an appropriate oxygen source to generate the desired color or other effect.

With soluble oxides such as molybdenum IV oxide, the metal oxide may be soaked into the substrate directly, and then reacted to produce a color. Also, solution A may include a combination of a salt of one metal such as titanium chlorate and an elemental metal, such as zinc powder, such that the elemental metal is oxidized by the salt to produce a metal salt which then reacts according to the invention.

The coloring agent may associate physically or chemically with the substrate, via absorption, mechanical admixture, entrapment, polar attraction, or covalent bonding. With cellulosic and leather products, the reaction may involve the

cellulose or collagen matrix of the substrate article. With masonry, the substrate may or may not react with the metal salt and oxygen source, so long as the colored compound is fixed insolubly within the substrate.

The invention also encompasses methods and compositions for imparting other desired stable physical effects to a substrate, where color may be a secondary factor. For example, with certain combinations of metal salts and oxygen sources, the substrate may have an improved texture, conductivity, photosensitivity, anti-fungal, antimicrobial, insect repellent, or fire retardant quality, as a result of treatment according to the invention. A method also imparts a desirable stable physical change by sequentially applying preparations A and B to the substrate and allowing them to react so as to fix or bond the reaction product to or within the substrate.

In some cases, the B solution is applied before the A solution in order to obtain a different effect. Different mineral solutions and different oxidizing agents create markedly different effects on wood, and these finishes can be customized for specific application to a wide variety of materials.

The invention relates to compositions and kits comprising the various A and B solutions prepared by combining water soluble or other mineral salts, oxidizing agents, and other substances into an aqueous solution.

The product has a variety of commercial applications including: wood stain, as an alternative to petroleum, acrylic,

and latex wood finishes; a wood aging system, to make new wood take on the appearance of old wood; stain for wood-like products, to color and preserve wood-like products such as bamboo; cloth stain, to color cloth, hemp, flax, textiles, leather, and other similar products; wood or other substrate preservation through anti-microbial or anti-fungicidal effects; and masonry stain: to color tile, cement, concrete, brick, stone, and other similar products. The invention can be used both indoors and outdoors, for wood and non-wood products. As can be appreciated, the metal salt can be selected to provide desirable preservative, antifungal, and/or insecticidal properties in addition to a color effect, or can be combined with known preservative treatments.

In some applications, the color may be secondary to the ability of the oxygen source to bind or link the metal ion into the substrate according to the two step process of the invention.

A kit according to the invention can be distributed in two containers such as plastic bottles, one for the A solution and one for the B solution. Bottles A and B can preferably contain a concentrated solution of key mineral salts or oxidizing agents dissolved in water, which the end-user will dilute in a gallon or other volume of water. Alternatively, the product may be distributed in powder or tablet form, requiring the end-user to dilute fully with water. The product can be distributed in fully diluted liquid form, ready to use, which increases shipping costs but reduces variability due to the type of water used and dilution techniques. Preferred formulas make use of only non-

toxic substances such as iron and silver sulfates and avoid toxic heavy metals such as chromium, cobalt, and lead, which minimize regulatory oversight, and shipping, labelling, and disposal requirements.

Preferred applications involve water-soluble solutions of minerals of low toxicity, usually in the form of mineral salts such as iron chloride in the A solution, and sodium peroxide or hydrogen peroxide as the oxygen source in the B solution. More toxic metals may also be used for an appropriate result, although they require additional precautions in handling and disposal. Other oxygen sources may be used, and the invention may be carried out in preparations other than water or aqueous solutions.

For example, a gel, paste, emulsion, or other thick preparation may be used for either or both components, so long as such a formulation is able to deliver the metal salt and oxygen source into the substrate in a reactive form. Typically, such a thick preparation would be an aqueous solution, although an emulsion with an oil or a suspension may be appropriate in certain applications.

To form the various preparations of Solution A, a measured weight of the mineral or minerals is mixed in a volume of purified water. To form the iterations of Solution B, liquid hydrogen peroxide or powdered sodium peroxide are mixed in a volume of water. Alternatively, sodium hydroxide is added to a hydrogen peroxide solution and may be neutralized or buffered if

desired. Certain other compounds may serve as an oxygen source according to the invention, such as citric acid or other organic and inorganic acids, provided that they react with an appropriate metal salt according to the invention in contact with the substrate to produce the desired effect.

The first step in applying the mineral stain is to apply a sufficient amount of Solution A onto the wood or other substrate so that it penetrates, using a brush, pad, roller, spraying device or other suitable method. The solution is generally clear, translucent or slightly cloudy, and alters the color of wood much the same way the application of water would. Some of the A solutions are orange or pink, some milky, some gray. When applied, however, in thin coatings, there is no appreciable color until the oxygen source is applied. Optionally colorants, thickeners, surfactants, and other additives may modify the appearance of the A solution. When the Solution A dries, in 5-30 minutes depending on temperature and humidity etc., the wood looks much as it did before anything was applied to it. A slight graying may be apparent.

The next step is to apply Solution B to the wood or substrate in much the same manner as Solution A. With a strong Solution B, the color in the wood changes immediately. With weaker solutions, the color comes on slowly, over five minutes or so. The process is reminiscent of making photographic film prints, or watching an instant photograph develop, or making invisible ink become visible. Strong iterations of Solution B

have a greater tendency to show brush marks, which can be a negative or positive, depending on the effect desired. The final depth of color in the stained wood is more dependent on the concentration of minerals in Solution A.

It is possible, in addition to mixing two or more mineral salts in an A solution or two peroxides in the B, to apply first one and then another A, or first a hydrogen peroxide-based and then a sodium peroxide-based B solution. Thus two basic steps of the process might, for certain effects, such as highlighting raised areas with a different color, etc. involve more than two steps.

The following mineral salts and oxides have been used according to the invention to stain wood: barium sulfate, calcium sulfate, cerium III nitrate, cerium III perchlorate, copper II nitrate, copper II acetate, copper II carbonate dihydroxide, copper sulfate, iron II sulfate, iron II perchlorate, iron II chloride, sodium thiosulfate, magnesium thiosulfate, potassium thiosulfate, potassium nitrate, potassium permanganate, silver sulfate, silver perchlorate, silver nitrate, titanium III sulfate, and zinc perchlorate.

Other mineral salts that may be used according to the invention include: aluminum potassium sulfate, molybdenum (VI) oxide, zinc sulfate, copper (II) chloride, nickel perchlorate, nickel sulfate, copper (II) perchlorate, tin (II) sulfate, tin (I) chloride, chromium (III) sulfate, aluminum sulfate, titanium hydride, chromium (III) perchlorate, zinc powder, manganese (II)

chloride, aluminum chloride, titanium (IV) chloride, silver chloride, and titanium (II) sulfate.

Other minerals capable of reacting with an oxygen source in contact with a substrate to color the substrate or provide other effects according to the invention may be selected from salts of elements of columns 2 through 6 of the Periodic Table of the Elements, including the transition elements, Lanthanides, and Actinides. Preferably, the metal is selected from aluminum, antimony, beryllium, bismuth, cadmium, chromium, cobalt, copper, gold, iridium, lead, magnesium, manganese, mercury, molybdenum, nickel, niobium, osmium, platinum, plutonium, potassium, rhodium, selenium, silicon, silver, sodium, tantalum, thorium, tin, titanium, tungsten, uranium, vanadium, and zinc.

As applied to wood and other substrates, the invention may employ any water-soluble mineral salt or oxidized mineral compound soluble in solvents such as acids, alcohols, or other aqueous substances. It may employ any oxidized mineral compounds capable of reacting with an oxygen source and a substrate to form a colored compound linked to the substrate. Such compounds are referred to collectively as metal salts, although some of the mineral elements are not metal, and some of the compounds are oxides, not salts.

The oxygen source may be any oxidizing agent capable of oxidizing mineral salts according to the invention in the presence of a substrate of wood, bamboo, leather, cellulose, and other suitable substrates. Preferred oxygen sources are

peroxides, compounds that include the peroxy (-O-O-) group. Peroxides form hydrogen peroxide upon solution in water. The invention may employ any inorganic or organic peroxide. Thus, the oxygen source may be a superoxide or ozonide, or a peroxyacid. It may also be a hypochlorite or chlorine dioxide, although these are relatively toxic and unstable.

The effect may vary with the source of water. The examples use purified water. Distilled water versus mineral-rich well water may result in slightly different effects. In general, however, the use of tap water or deionized water gives adequate results. In other cases, modifying the pH or ionic strength with additives may be desirable.

The effect may vary with the solution in which the minerals or peroxides are dissolved or suspended. In the examples below, water is used, but other liquids could be used, some with non-water-soluble minerals. Instead of a solution, the minerals could be dissolved or suspended in a gel, wax, lotion, or creme and rubbed into the wood or substrate, so long as adequate penetration results. The wood or substrate must also be susceptible to penetration by an appropriate oxygen source, and the vehicle must be compatible in that it does not interfere with the color-producing reaction.

The effect may vary with the concentrations of the solutions. Generally, more dilute solutions create lighter color density but in some cases they actually give the appearance of a different color.

The effects produced do not vary appreciably with the ambient temperature at which the solutions are applied. The process can be followed at any temperature above or even slightly below 32°F or the freezing point, and the stained wood is dry and ready to be top-coated (if desired) in less than an hour, depending on humidity and temperature conditions. For extremely low-temperature applications, minerals and/or oxidizing agents can be dissolved in alcohol or other non-water solutions. In the examples below, the tests took place at room temperature, but experiments at near-freezing temperatures seemed to create the same result. The invention can also be applied at upper extremes of temperature or high or low pressure, if appropriate.

Reactions and resultant color and textural appearance of the substrate vary with the substrate material. In the examples below, sugar pine was used but the method of the invention has been successfully applied to northern pine, ponderosa pine, alder, poplar, maple, oak, ash, cedar, cherry, walnut, obinji and other woods and, of course, the results vary widely with the color, tone, and character of each type of wood. Successful demonstrations have also been done on ply bamboo, cotton, leather, and masonry. Ply bamboo is a very hard wood product, does not stain well with conventional products but is susceptible to coloring according to the invention. Other substrates are suitable so long as they are made of a material capable of binding the mineral salt in the presence of the oxygen source according to the invention.

Effects may vary with the order of application of solutions A and B. In general, starting with B and finishing with A yields a similar color but less nuances of wood grain, which could be preferable in certain applications. In simulating aged wood, for example, the A solution should be applied first. For a non-aged appearance and an even color, the B solution can be applied first. It may be that applying B first makes for a more superficial penetration of the linked color in the wood, but this may be appropriate for thin substrates. With porous substrates, such as fabric or leather, it is preferable to soak the substrate in the solutions to ensure even staining.

The results also vary with the additives included in solutions A or B such as pigments or dyes, citric acid, bleaches, alcohols, solvents, thickeners, tableting agents, finishing agents such as an appropriate overcoat of acrylic and other resins or polyurethanes that might oxidize and seal the wood simultaneously. Alternatively, an over coat sealer may be applied over the stain. An overcoat may optionally be included into Solution B (or solution A if that is applied last).

Stained wood according to the invention has been subjected to accelerated weathering situations, exposure to sun, hot water, freezing temperatures, and submersion in water. It is resistant to fading and actually is made slightly darker or warmer in tone on exposure. These tests show that the product produces a remarkably permanent stain suitable for use by professionals and amateurs, for interior and exterior application.

In all the examples defined in the specification (pages 18-21), Solution A is made up as a solution of mineral in water. Concentrations are given as percent (weight/volume), or the number of grams of mineral and the volume of water is given. Solution B is made up of a 15% (v/v) solution hydrogen peroxide or a 0.3% sodium peroxide solution (made from 3.0 grams per liter of water). In all these cases, the substrate is Sugar Pine unless specifically mentioned otherwise. Different woods or other substrates work equally well, but the colors are somewhat different. These experiments were conducted with an ambient temperature around 65-75°F. Upon application of the B solution, color appeared in from less than one second to up to one minute. Experiments at different temperatures have only marginally different results. Different strengths of Solution B speed or slow the reaction, but result in similar end colors. The key variable determining the color is the mineral or minerals in Solution A.

ISSUES

Whether claims 1 and 31 are patentable under 35 U.S.C. 112, second paragraph?

Whether claim 1 is patentable under 35 U.S.C. 102(b) over Matsushita (JP 60-250,906)?

Whether claims 3-7, 9-10 and 30-36 are patentable under 35 U.S.C. 102(b) over Brown (U.S. patent 5,173,085)?

Whether claims 3-10 and 30-36 are patentable under 35 U.S.C. 102(b) over Tennigkeit (U.S. patent 4,992,077)?

Whether claims 1, 3-6, 9-10, 30, and 32-36 are patentable under 35 U.S.C. 102(b) over Light (SU 499,297)?

Whether claims 3-7, 30, 31, and 36 are patentable under 35 U.S.C. 102(b) over Yantai (Yantai University 86-104,010)?

Whether claims 2-8, 9-10, 20-22, 30-34, and 36, are patentable under 35 U.S.C. 102(b) over Dombay (U.S. patent 3,554,785)?

Whether claims 2-10, 20, 21, 30, 31, and 36 are patentable under 35 U.S.C. 102(b) over Bures (CS 145,495)?

Whether claims 2-8, 9-10, 20-22, and 30-36, are patentable under 35 U.S.C. 103(a) over Dombay (U.S. patent 3,554,785)?

Whether claims 2-10, 20-22, 30-36 are patentable under 35 U.S.C. 103(a) over Bures (CS 145,495)?

GROUPING OF CLAIMS

The claims do not stand or fall together.

ARGUMENTS

Claims 1 and 31 are patentable under 35 U.S.C. 112, second paragraph.

The last five lines of claim 1 simply define the function of the components of the kit. Therefore, the Examiner's statement that "it is improper to recite method steps in a kit claim" is not understood. Besides, that recitation cannot, and does not,

form any basis for the Examiner's rejection of the claim being "indefinite." Contrarily, the last five lines of claim 1 render claim 1 definite than otherwise. Thus, the rejection of claim 1 should be reversed.

Claim 31 does not reference any "base." Applicant had deleted the term "base" in a Response filed April 28, 2000. In fact, the Examiner acknowledged in a subsequent office action (paper # 31, page 2) that applicant had proposed that amendment (among others) to incorrect line numbers, and that the Examiner had entered the proposed amendments to the correct lines, which included line 8 of claim 31 which had recited the term "base". Reversal of this rejection is also respectfully requested.

The present claims are patentable under 35 U.S.C. 102(b).

For an invention to be anticipated, it must be demonstrated that each and every element of the claimed invention is present in the "four corners" of a single prior art, either expressly described therein or under the principle of inherency. Lewmar Marine Inc. v Barient Inc., 3 USPQ2d 1766, 1767-1768 (CAFC, 1987).

Each of the present claims is patentable over the art of record.

The invention uniquely provides permanent wood staining without use of hazardous or environmentally unfriendly chemicals, which is new and unobvious. The invention has two parts, and the staining is accomplished in two steps. The first part is an

aqueous solution of metal salts, which is applied to the wood and which penetrates the surface of the wood. The second solution is an aqueous oxidizer solution which penetrates the wood and fixes the metal salts in place within the wood.

Claim 1 is patentable under 35 U.S.C. 102(b) over Matsushita.

Claim 1 describes a kit for imparting a pre-determined color to a solid wood substrate, comprising an aqueous solution of a first compound consisting of a mineral salt and water as a first application on the solid wood substrate, and a second component comprising an aqueous solution of a peroxide as a sequential application on the solid wood substrate, the mineral salt and peroxide solutions as sequential applications in effective amounts on the substrate and colored layer on the substrate formed by the applications reacting with each other in the presence of the substrate to impart the color to the substrate.

Matsushita relates to colored woods manufactured by impregnating woods with reactive coloring solutions and with dye solutions and synthetic resins and color coatings. The present specification clearly points out the disadvantages of prior art staining systems, such as Matsushita, and provides for a unique coloring system that allows substances to be applied to the wood that react in situ resulting in automatic coloring of the substrate because of the reaction. Claim 1 does not relate to coloring the substrate by applying a dye or a synthetic resin or

coloring solutions. Matsushita thus teaches away from the claimed invention and cannot anticipate claim 1.

The absence from prior art reference any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible, Inc., 230 USPQ 81, 84 (Fed. Cir. 1986).

Claims 3-7, 9-10 and 30-36 are patentable under 35 U.S.C. 102(b) over Brown.

Claim 30 describes a kit for treating and coloring a wood substrate, comprising a first component aqueous solution of oxidizable metal salt preparation for a first application to the wood substrate, and a second component aqueous solution of oxygen source preparation for a sequential application to the wood substrate, the aqueous solution preparations being adapted to sequentially penetrate the wood substrate when sequentially applied, and both aqueous solution preparations when applied sequentially in effective amounts, being adapted to react with each other within the wood substrate to impart physical color characteristic to the wood substrate.

Brown does not dye wood, but rather dyes hair, which has nothing to do with dying wood. Moreover, Brown has an intermediate step of contacting hair with an organic solution and rinsing or shampooing the hair, and then bleaching the hair with hydrogen peroxide to obtain a lighter color. The hydrogen peroxide in Brown leads away from the present invention, because the hydrogen peroxide does not fix the metal salts in place. Nor

is there anything in Brown which would suggest that Brown be used with wood.

The dependent claims add further unique features to claim 30, and each is patentable over Brown.

Claim 3 adds to claim 30 that the oxygen source is a peroxide and both formulations are aqueous solutions.

Claim 4 adds to claim 30 that the metal salt is selected from the group consisting of salts of iron, silver, zinc, cerium, copper, magnesium, molybdenum, nickel, tin, chromium, aluminum, barium, calcium, sodium, potassium, and titanium, and combinations.

Claim 5 adds to claim 30 that the metal salt is selected from the group consisting of salts of aluminum, antimony, beryllium, bismuth, cadmium, chromium, cobalt, copper, gold, iridium, lead, magnesium, manganese, mercury, molybdenum, nickel, niobium, osmium, platinum, plutonium, potassium, rhodium, selenium, silicon, silver, sodium, tantalum, thorium, tin, titanium, tungsten, uranium, vanadium, and zinc, and combinations.

Claim 6 adds to claim 30 that the metal salt is selected from the group consisting of sulfates, chlorides, perchlorates, acetates, nitrates, permanganates, thiosulfates, and oxides, and combinations.

Claim 7 adds to claim 30 that the metal salt is selected from the group consisting of silver sulfate, silver perchlorate, silver nitrate, silver sulfate, iron (II) chloride, zinc

perchlorate, iron (II) perchlorate, iron (II) sulfate, copper acetate, sodium thiosulfate, magnesium thiosulfate, potassium thiosulfate, potassium nitrate, potassium permanganate, copper nitrate, copper II carbonate dihydroxide, copper sulfate, titanium III sulfate, magnesium nitrate, cerium (III) perchlorate, and cerium nitrate, and combinations.

Claim 9 adds to claim 30 that the oxygen source is a peroxide.

Claim 10 adds to claim 30 that the oxygen source is selected from the group consisting of hydrogen peroxide, sodium peroxide, zinc peroxide, calcium peroxide, barium peroxide, and lithium peroxide, and combinations.

Claim 30 describes a kit for coloring a wood substrate, comprising a metal salt preparation, and an oxygen source preparation, the preparations being adapted to penetrate the substrate when applied, and both preparations, when applied sequentially in effective amounts, being adapted to react with each other to impart a fixed physical characteristic to the substrate.

Claim 31 adds to claim 30 that the metal salt preparation and/or the oxygen source preparation further comprises an additive selected from the group consisting of thickener, alcohol, emulsifier, coloring agent, pigment, dye, bleach, sealer, finishing agent, tint, acrylic finish, latex finish, polyurethane, alcohol, gelling agent, tableting agent, surfactant, buffer, citric acid, tannic acid, acetic acid, other

acid, color, salt, stabilizer, antimicrobial, antifungal, insecticide, insect repellent, ultraviolet protectant, and fire retardant, and combinations.

Claim 32 adds to claim 30 that the metal salt preparation is an aqueous solution comprising between about 0.001% and about 20% (w/v) metal salt.

Claim 33 adds to claim 30 that the oxygen source preparation is an aqueous solution comprising between about 0.1% and about 50% (w/v) peroxide.

Claim 34 adds to claim 30 that the metal salt preparation is an aqueous solution comprising between about 0.025 % and about 8% (w/v) metal salt.

Claim 35 adds to claim 30 that the oxygen source preparation is an aqueous solution comprising between about 0.3% and about 15% peroxide.

Claim 36 adds to claim 30 that the preparations are concentrates suitable for dilution by a user.

Brown, from an unrelated art, provides for dyeing hair to promote melanogenesis in hair, which has nothing to do with solid wood substrate coloring. Brown defines dyeing the hair with intermittent intervals to a dark color and then treating with hydrogen peroxide to obtain the desired color. That is contrary to the claimed in situ reaction of the mineral salts and hydrogen peroxide within the wood substrate being treated.

Thus, Brown does not teach nor suggest the claimed invention and therefore cannot anticipate the claims.

Claims 3-10 and 30-36 are patentable under 35 U.S.C. 102(b) over Tennigkeit.

Claims 3-10 and 30-36 have been described earlier.

Like Brown, Tennigkeit relates to dyeing hair with an oxidation dye mixed with an oxidizing agent and a catalyst. However, nothing in the reference teaches, suggests or inherently provides for coloring a wood substrate in which substances are applied to the substrate and react in situ to provide the coloring which has nothing to do with pre-made dyes being applied to hair. Thus, the reference leads away from the claimed invention.

"To establish inherency, the extrinsic evidence 'must make it clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" In re Robertson, 48 USPQ2d 1949, 1951 (Fed. Cir. 1999) quoting from Continental Can Co. v. Monsanto Co., 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

Claims 1, 3-6, 9-10, 30, and 32-36 are patentable under 35 U.S.C. 102(b) over SU '297 (Light).

Claim 1 describes a kit for imparting a pre-determined color to a solid wood substrate, comprising a first component of an aqueous solution of a mineral salt, and a second component of an aqueous solution of a peroxide, the mineral salt and peroxide solutions being capable, when applied sequentially in effective

amounts to the wood substrate, of reacting with each other in the presence of the wood substrate to impart the color to the substrate.

Claims 3-6, 9-10, 30, and 32-36 have been described earlier.

Light has nothing to do with the present invention because Light is a process for de-canning goatskin, followed by a pickling and re-canning or final canning, followed by neutralization and a combined dying and tallowing. Nothing in Light would refer to wood, and the use of the multiple steps in Light would lead away from the present invention. The complexity of Light would lead one away from the present invention. Moreover, there is nothing in the multiple step process of treating leather that would suggest a dying of wood in a two-step process.

Light relates to leather glove production by tanning in a combined hydrogen peroxide-sodium hydroxide solution and then treating with aluminum slats and dyeing. The reference teaching seeks to solve the problem of repeated tanning and pickling of leather rather than having anything to do with color preservation as uniquely provided by the present invention.

"Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Continental Can Co. v. Monsanto Co., 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

Claims 3-7, 30, 31, and 36 are patentable under 35 U.S.C. 102(b) over Yantai.

Claims 3-7, 30, 31, and 36 have been described earlier.

Yantai relates to treatment of marble to form glazed surfaces and thereafter etching and exposing the treated surface to make black markings of the decorations. That teaching has nothing to do with wood substrates and would in fact lead away from the present invention since there is not teaching or suggestion of an in situ reaction of two solutions to give an end-result of substrate collation.

Claims 2-8, 9-10, 20-22, 30-34, and 36 are patentable under 35 U.S.C. 102(b) over Dombay.

Claims 2-7, 9-10, and 30-34, and 36 have been described earlier.

Claim 8 adds to claim 30 that the metal salt is selected from the group consisting of molybdenum (VI) oxide, zinc sulfate, copper (II) chloride, nickel perchlorate, nickel sulfate, copper (II) perchlorate, tin (II) sulfate, tin (I) chloride, chromium (III) sulfate, aluminum sulfate, cerium (III) perchlorate, zinc perchlorate, titanium hydride, chromium (III) perchlorate, zinc powder, manganese (II) chloride, aluminum chloride, titanium (IV) chloride, silver chloride, and titanium (II) sulfate, and combinations.

Claim 20 adds to claim 2 the step of drying the substrate between the two steps.

Claim 21 adds to claim 2 that the preparations are aqueous solutions and are applied between the freezing point and boiling point of the solutions under the process conditions of the method.

Claim 22 adds to claim 2 applying a sealing coat over the substrate surface.

Dombay merely coats wood with an oxidizing agent to lighten the wood. Dombay uses ammonium persulfate, and cupric sulfate as accelerants in concentrated hydrochloric acid with a methylated spirit, and an organic solvent teepol. In some cases Dombay treats some woods with an A solution to produce a darkening effect, and some woods with a B solution to produce a lightening effect. Whatever the result of Dombay, it is clear that Dombay does not teach the present invention as specifically pointed out in the claims.

Dombay relates to wood bleaching in which the reference mandates the use of methylated spirit, which the present invention particularly avoids. The present specification describes the ill-effects of prior art procedures that mandate alcohol based substances which harm the environment. In fact, Example 4, relied on by the Examiner, provides for 150 ml of methylated spirit. Potassium permanganate and cupric sulphate are used as bleaching accelerants in the one-step Dombay bleaching process. Acetic acid is used to stop the bleaching.

Nothing in the entire reference teaches or suggests the unique kit that has an aqueous solution of a mineral salt and an

aqueous solution of a peroxide, with the mineral salt solution being applied prior to the peroxide solution and the in situ reaction of the applied substances with the substrate.

Claims 2-10, 21, 30, 31, and 36 are patentable under 35 U.S.C. 102(b) over Bures.

Claims 2-10, 21, 30, 31, and 36 have been described earlier.

Bures relates to a three step process of treating woods with metal salts, oxidants, dyes and permeation agents. However, the reference does not teach nor suggest a kit for treating and coloring a wood substrate, comprising a first component aqueous solution of oxidizable metal salt preparation for a first application to the wood substrate, and a second component aqueous solution of oxygen source preparation for a sequential application to the wood substrate.

Bures has nothing to do with the aqueous solution preparations being adapted to sequentially penetrate the wood substrate when sequentially applied, and both aqueous solution preparations when applied sequentially in effective amounts, being adapted to react with each other within the wood substrate to impart physical color characteristic to the wood substrate.

Since the cited reference does not disclose all the elements of the present invention, the reference cannot anticipate the present invention. Lacking an element of the claims, the reference cannot anticipate the invention. Carmen Indus., Inc. v. Wahl, 220 USPQ 481, 485 (Fed. Cir. 1983).

Lacking the claimed elements, the references cannot anticipate the present claims.

The present claims are patentable under 35 U.S.C. 103(a).

In considering the patentability of the present invention, it is requested that the Board consider the invention as a whole, consider the scope and content of the prior art as a whole, consider the differences between the claims at issue and the prior art, and consider the level of ordinary skill in the art to which the invention pertains at the time the invention was made. Graham v. John Deere Co., 148 USPQ 459, 467 (1966).

THE INVENTION AS A WHOLE

The invention considered as a whole is best described by the appended claims.

PRIOR ART AS A WHOLE

The prior art to which the invention pertains is typified by the references of record.

DIFFERENCES BETWEEN THE INVENTION AND THE PRIOR ART

Each of the present claims defines unique features and each is individually patentable over the prior art.

The test in reviewing rejections under 35 U.S.C. 103 in which the examiner has relied on teachings of several references, is whether references, viewed individually and collectively,

would have suggested claimed invention to a person possessing ordinary skill in the art, and citing references which merely indicate that isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding that combination of the claimed elements would have been obvious. Ex parte Hiyamizu, 10 USPQ2d 1393-1395 (Board of Patent Appeals and Inter., 1988); In re Kaslow, 217 USPQ 1089 (Fed. Cir. 1983); In re Deminski, 230 USPQ 313 (Fed. Cir. 1986).

Claims 2-8, 9-10, 20-22, and 30-36, are patentable under 35 U.S.C. 103(a) over Dombay.

Claim 2 defines a method for treating and coloring a wood substrate with the kit of claim 30 comprising the steps of contacting a substrate with a formulation comprising a metal salt, and allowing an effective amount of the formulation to penetrate the substrate, and sequentially but without regard to order; contacting the substrate with a formulation comprising an oxygen source, and allowing an effective amount of the formulation to penetrate the substrate; such that the two formulations react with each other in contact with the substrate to impart a stable change to the characteristics of the substrate.

Claim 3 adds to claim 30 that the oxygen source is a peroxide and both formulations are aqueous solutions.

Claim 4 adds to claim 30 that the metal salt is selected from the group consisting of salts of iron, silver, zinc, cerium,

copper, magnesium, molybdenum, nickel, tin, chromium, aluminum, barium, calcium, sodium, potassium, and titanium, and combinations.

Claim 5 adds to claim 30 that the metal salt is selected from the group consisting of salts of aluminum, antimony, beryllium, bismuth, cadmium, chromium, cobalt, copper, gold, iridium, lead, magnesium, manganese, mercury, molybdenum, nickel, niobium, osmium, platinum, plutonium, potassium, rhodium, selenium, silicon, silver, sodium, tantalum, thorium, tin, titanium, tungsten, uranium, vanadium, and zinc, and combinations.

Claim 6 adds to claim 30 that the metal salt is selected from the group consisting of sulfates, chlorides, perchlorates, acetates, nitrates, permanganates, thiosulfates, and oxides, and combinations.

Claim 7 adds to claim 30 that the metal salt is selected from the group consisting of silver sulfate, silver perchlorate, silver nitrate, silver sulfite, iron (II) chloride, zinc perchlorate, iron (II) perchlorate, iron (II) sulfate, copper acetate, sodium thiosulfate, magnesium thiosulfate, potassium thiosulfate, potassium nitrate, potassium permanganate, copper nitrate, copper II carbonate dihydroxide, copper sulfate, titanium III sulfate, magnesium nitrate, cerium (III) perchlorate, and cerium nitrate, and combinations.

Claim 8 adds to claim 30 that the metal salt is selected from the group consisting of molybdenum (VI) oxide, zinc sulfate,

copper (II) chloride, nickel perchlorate, nickel sulfate, copper (II) perchlorate, tin (II) sulfate, tin (I) chloride, chromium (III) sulfate, aluminum sulfate, cerium (III) perchlorate, zinc perchlorate, titanium hydride, chromium (III) perchlorate, zinc powder, manganese (II) chloride, aluminum chloride, titanium (IV) chloride, silver chloride, and titanium (II) sulfate, and combinations.

Claim 9 adds to claim 30 that the oxygen source is a peroxide.

Claim 10 adds to claim 30 that the oxygen source is selected from the group consisting of hydrogen peroxide, sodium peroxide, zinc peroxide, calcium peroxide, barium peroxide, and lithium peroxide, and combinations.

Claim 20 adds to claim 2 the step of drying the substrate between the two steps.

Claim 21 adds to claim 2 that the preparations are aqueous solutions and are applied between the freezing point and boiling point of the solutions under the process conditions of the method.

Claim 22 adds to claim 2 applying a sealing coat over the substrate surface.

Claim 30 describes a kit for coloring a wood substrate, comprising a metal salt preparation, and an oxygen source preparation, the preparations being adapted to penetrate the substrate when applied, and both preparations, when applied sequentially in effective amounts, being adapted to react with

each other to impart a fixed physical characteristic to the substrate.

Claim 31 adds to claim 30 that the metal salt preparation and/or the oxygen source preparation further comprises an additive selected from the group consisting of thickener, alcohol, emulsifier, coloring agent, pigment, dye, bleach, sealer, finishing agent, tint, acrylic finish, latex finish, polyurethane, alcohol, gelling agent, tableting agent, surfactant, buffer, citric acid, tannic acid, acetic acid, other acid, color, salt, stabilizer, antimicrobial, antifungal, insecticide, insect repellant, ultraviolet protectant, and fire retardant, and combinations.

Claim 32 adds to claim 30 that the metal salt preparation is an aqueous solution comprising between about 0.001% and about 20% (w/v) metal salt.

Claim 33 adds to claim 30 that the oxygen source preparation is an aqueous solution comprising between about 0.1% and about 50% (w/v) peroxide.

Claim 34 adds to claim 30 that the metal salt preparation is an aqueous solution comprising between about 0.025 % and about 8% (w/v) metal salt.

Claim 35 adds to claim 30 that the oxygen source preparation is an aqueous solution comprising between about 0.3% and about 15% peroxide.

Claim 36 adds to claim 30 that the preparations are concentrates suitable for dilution by a user.

As previously pointed out, Dombay merely coats wood with an oxidizing agent to lighten the wood. Dombay uses ammonium persulfate, and cupric sulfate as accelerants in concentrated hydrochloric acid with a methylated spirit, and an organic solvent teepol. Dombay treats some woods with an A solution to produce a darkening effect, and some woods with a B solution to produce a lightening effect. It is clear that Dombay does not teach the present invention as specifically pointed out in the claims.

Dombay relates to wood bleaching in which the reference mandates the use of methylated spirit, which the present invention particularly avoids. The present specification describes the ill-effects of prior art procedures that mandate alcohol based substances which harm the environment. In fact, Example 4, relied on by the Examiner, provides for 150 ml of methylated spirit. Potassium permanganate and cupric sulphate are used as bleaching accelerants in the one-step Dombay bleaching process. Acetic acid is used to stop the bleaching.

That [the prior art] might incorporate elements which could be used in appellants' system does not render appellants' claims obvious when there is no suggestion of using these elements in substantially the same manner as appellants use them. In re Donovan, 184 USPQ 414, 421 (CCPA, 1975).

Claims 2-10, 20-22, 30-36 are patentable under 35 U.S.C. 103(a) over Bures.

Claims 2-10, 20-22, and 30-36 have been described earlier.

As previously stated, Bures relates to a three step process of treating woods with metal salts, oxidants, dyes and permeation agents. However, the reference does not teach nor suggest a kit for treating and coloring a wood substrate, comprising a first component aqueous solution of oxidizable metal salt preparation for a first application to the wood substrate, and a second component aqueous solution of oxygen source preparation for a sequential application to the wood substrate.

Like each of the other references, Bures too expressly intends to impart a stabilized color to dark and medium colored woods by utilizing hypochlorite, persulphate and peroxide compounds. The use of mineral salt ions specifically Iron, Zinc or Silver is not employed or mentioned. In fact, the reference relies on the exclusive use of hypochlorite, persulphate and peroxide compounds to bleach wood.

Contrastingly, the claimed process is expressly concerned with darkening the color of the top-most layer of wood cellulose and other substrates by transitioning water soluble mineral ions into oxides within the top-most layer of the substrate. The process bonds the transitioned minerals to the cellulose fibers and creates a more or less stable color which may slightly lighten or darken over time.

In fact, none of the references teach or suggest the claimed two step in situ treatment with the unique kit defined in the present claims. The present invention uniquely provides treatment of all substrates including light colored wood and is exclusively a two part process.

"To establish inherency, the extrinsic evidence 'must make it clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" In re Robertson, 48 USPQ2d 1949, 1951 (Fed. Cir. 1999) quoting from Continental Can Co. v. Monsanto Co., 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Id. 20 USPQ2d at 1749.

The invention provides an aqueous solution of a mineral salt thereby providing water soluble ions of mineral salts which are applied to a suitable substrate and allowed to briefly dry. In a second step the water soluble mineral salts transition into insoluble mineral oxide compounds which form inside and around the cellulose fibers. The agents used to transition the mineral salt ions into insoluble oxide compounds include dilute hydrogen peroxide solutions, to prevent harm to the environment, and other dilute strength agents such as sodium peroxide and sodium hydroxide. Again, stronger solutions pose a greater threat to the environment and user.

The present process is expressly useful in enhancing the natural nuances of a particular piece of wood, thereby giving it a more natural color than a conventional stain. The process enhances the variations of color within a given species of wood, therefore differing from the prior art, all of which aim to provide bleaching for more uniform color of wood or of hair, which is not relevant.

The commercial viability of the present process relies on enhancing the naturally occurring qualities of a specific wood particularly lighter colored species such a Pine, Larch, Poplar, Alder, Maple, Fur, Ash, Bamboo (a grass), Hackberry, Black Willow, Oak, Birch, and others. All of those are considered colored woods, many of which are rapidly grown, sustainable harvestable species.

"The inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown. In re Spormann and Heinke, 150 USPQ 449, 452 (CCPA 1966). "... if the Patent Office wishes to rely on what 'Those familiar with [invention] would know,' it must produce some reference showing what such knowledge consists of." Id.

The light fastness is considerably better than prior art dyes (specifically aniline dyes) used to color wood and other substrates. The primary commercial use for the invention is to impart a range of colors (earth tones primarily) to light and medium colored woods and to use as an alternative to conventional

staining products which may contain hazardous VOC's or other hazardous chemical compounds. Also, conventional dyes and colorants for wood does not enhance the natural qualities of the wood or other substrate as does the Auger Mineral Stain Process.

Minerals used in the present invention expressly create color within the wood or substrate. Minerals utilized alone or in combination are: Iron, Zinc and Silver salts, specifically Iron I Chloride, Sulfate and Perchlorate; Zinc Perchlorate, Silver Perchlorate and Silver Nitrate, among others.

No potassium persulphate, sodium persulfate, ammonium persulfate, sodium carbonate, acetic acid, glacial acetic acid, potassium permanganate, cupric ions or ammonia are used in the claimed process. Thus, the claimed invention always imparts the substrate with an alkaline pH.

See In re Meng, 181 USPQ 94, 97 (CCPA 1974), wherein the Court held:

"Of course the invention seems simple, after the fact. But simplicity, particularly in an old and crowded art, may argue for rather than against patentability. In re Sporck, 133 USPQ 360 (CCPA 1962). Progress in the crowded arts, usually made in small increments, is as important as it is in arts at the pioneer stage. In re Hummer, 113 USPQ 66 (CCPA 1957). The Constitution envisages and seeks progress in the 'useful arts,' not just those more esoteric or scientific."

Proper surface preparation consistent with any preparatory procedure used to prepare wood for finishing allows for adequate penetration of the mineral salt solution. Additionally an anionic surfactant may be added to the mineral salt solution to aid in the penetration of the mineral salt solution, this is

especially useful for industrial and manufacturing situations where dust, grease and other debris may be present and form surface tension prohibiting the mineral salt solution (A) from penetrating the substrate.

"The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency]." In re Rijckaert, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993), quoting from In re Oelrich, 212 USPQ 323, 326 (CCPA 1981). "Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection." Rijckaert, id., quoting from In re Newell, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

Contrary to the prior art, and according to the invention, the solution is completely dry prior to the application of the (catalyst) solution. Also, contrary to the prior art, the present invention transitions the European Oak instantly through its process to the yellow color the prior art is attempting to avoid. By producing the yellow or "aged" color Auger allows woodworkers to match the tone of "aged" or "antique" wood thereby giving woodworkers the opportunity to make reproductions, restore or color wood articles in a manner consistent with the color expected from wood which has acquired an "aged" or "antique" appearance.

The Board, in Ex parte Levengood, 28 USPQ2d 1300, 1301 (Board of App. and Inter. 1993), observed:

"The only suggestion for the examiner's combination of the isolated teachings of the applied references improperly

stems from appellant's disclosure and not from the applied prior art. In re Ehrreich, 200 USPQ 504 (CCPA 1979). At best, the examiner's comments regarding obviousness amount to an assertion that one of ordinary skill in the art would have been able to arrive at the appellant's invention because he had the necessary skills to carry out the requisite... steps. This is an inappropriate standard for obviousness."

The above is true for the present case.

Nothing in the references, either singly or in combination, teaches or suggests the claimed features. Therefore, the references cannot anticipate nor render obvious any of the claims.

LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art is an artisan being taught the reference teachings.

SUMMARY

Claims 1 and 31 are patentable under 35 U.S.C. 112, second paragraph.

Each of the present claims is patentable under 35 U.S.C. 102(b) over the prior art of record.

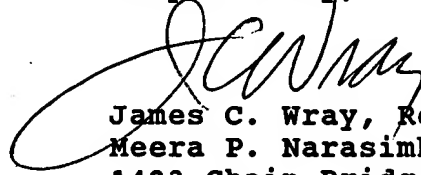
When considering the present invention as a whole and the prior art to which the invention pertains as a whole, when considering the differences between the present invention and the prior art, and when considering the level of ordinary skill in the art to which the invention pertains, it is clear that the invention would not have been obvious under 35 U.S.C. 103(a) to a

person having ordinary skill in the art at the time the invention was made.

CONCLUSION

Reversal of the Examiner and allowance of all the claims are respectfully requested.

Respectfully,



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June 18, 2001



APPENDIX

APPEALED CLAIMS:

1. A kit for imparting a pre-determined color to a solid wood substrate, comprising:

(a) an aqueous solution of a first component consisting of a mineral salt and water as a first application on the solid wood substrate, and

(b) a second component comprising an aqueous solution of a peroxide as a sequential application on the solid wood substrate, the mineral salt and peroxide solutions applied sequentially in effective amounts to the substrate and reacting with each other in the presence of the substrate to impart the color to the substrate.

2. Treating and coloring a wood substrate with the kit of claim 30 comprising the steps of:

(a) contacting the wood substrate with the first component aqueous solution preparation comprising the oxidizable metal salt, and allowing an effective amount of the first component aqueous solution preparation to penetrate the wood substrate, and sequentially but without regard to order,

(b) contacting the wood substrate with the second component aqueous solution preparation comprising an oxygen source, and allowing an effective amount of the second component aqueous solution preparation to penetrate the wood substrate,

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(c) reacting in situ within the wood substrate the first and the second component aqueous solution preparations with each other in contact with the wood substrate, and

(d) imparting a stable color change to color characteristics of the wood substrate.

3. The kit of claim 30, wherein the oxygen source is a peroxide and both preparations are exclusively aqueous solutions.

4. The kit of claim 30, wherein the metal salt is selected from the group consisting of salts of iron, silver, zinc, cerium, copper, magnesium, molybdenum, nickel, tin, chromium, aluminum, barium, calcium, sodium, potassium, and titanium, and combinations thereof.

5. The kit of claim 30, wherein the metal salt is selected from the group consisting of salts of aluminum, antimony, beryllium, bismuth, cadmium, chromium, cobalt, copper, gold, iridium, lead, magnesium, manganese, mercury, molybdenum, nickel, niobium, osmium, platinum, plutonium, potassium, rhodium, selenium, silicon, silver, sodium, tantalum, thorium, tin, titanium, tungsten, uranium, vanadium, and zinc, and combinations thereof.

6. The kit of claim 30, wherein the metal salt is selected from the group consisting of sulfates, chlorides, perchlorates, acetates, nitrates, permanganates, thiosulfates, and oxides, and combinations thereof.

7. The kit of claim 30, wherein the metal salt is selected from the group consisting of silver sulfate, silver perchlorate,

silver nitrate, iron (II) chloride, zinc perchlorate, iron (II) perchlorate, iron (II) sulfate, copper acetate, sodium thiosulfate, magnesium thiosulfate, potassium thiosulfate, potassium nitrate, potassium permanganate, copper nitrate, copper II carbonate dihydroxide, copper sulfate, titanium III sulfate, magnesium nitrate, cerium (III) perchlorate, and cerium nitrate, and combinations thereof.

8. The kit of claim 30, wherein the metal salt is selected from the group consisting of molybdenum (VI) oxide, zinc sulfate, copper (II) chloride, nickel perchlorate, nickel sulfate, copper (II) perchlorate, tin (II) sulfate, tin (I) chloride, chromium (III) sulfate, aluminum sulfate, cerium (III) perchlorate, zinc perchlorate, titanium hydride, chromium (III) perchlorate, manganese (II) chloride, aluminum chloride, titanium (IV) chloride, silver chloride, and titanium (II) sulfate, and combinations thereof.

9. The kit of claim 30, wherein the oxygen source is a peroxide.

10. The kit of claim 30, wherein the oxygen source is selected from the group consisting of hydrogen peroxide, sodium peroxide, zinc peroxide, calcium peroxide, barium peroxide, and lithium peroxide, and combinations thereof.

20. The treating of claim 2, further comprising the step of drying the substrate between the two contacting steps.

21. The treating of claim 2, wherein the aqueous solutions are applied between the freezing point and boiling point of the solutions under the process conditions of the method.

22. The treating of claim 2, further comprising a sealing coat over a substrate surface.

30. A kit for coloring a wood substrate, comprising

(a) a first component aqueous solution of oxidizable metal salt preparation for a first application to the wood substrate, and

(b) a second component aqueous solution of oxygen source preparation for a sequential application to the wood substrate,

the aqueous solution preparations being adapted to sequentially penetrate the wood substrate when sequentially applied, and both aqueous solution preparations when applied sequentially in effective amounts, being adapted to react with each other within the wood substrate to impart physical color characteristic to the wood substrate.

31. The kit of claim 30, wherein the metal salt preparation and/or the oxygen source preparation further comprises an additive selected from the group consisting of thickener, emulsifier, coloring agent, pigment, dye, bleach, sealer, finishing agent, tint, acrylic finish, latex finish, polyurethane, alcohol, gelling agent, tableting agent, surfactant, buffer, citric acid, tannic acid, acetic acid, other acid, color, salt, stabilizer, antimicrobial, antifungal,

insecticide, insect repellant, ultraviolet protectant, and fire retardant, and combinations.

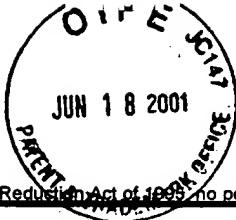
32. The kit of claim 30, wherein the metal salt preparation is an aqueous solution comprising between about 0.001% and about 20% (w/v) metal salt.

33. The kit of claim 30, wherein the oxygen source preparation is an aqueous solution comprising between about 0.1% and about 50% (w/v) peroxide.

34. The kit of claim 30, wherein the metal salt preparation is an aqueous solution comprising between about 0.025 % and about 8% (w/v) metal salt.

35. The kit of claim 30, wherein the oxygen source preparation is an aqueous solution comprising between about 0.3% and about 15% peroxide.

36. The kit of claim 30, wherein the preparations are concentrates suitable for dilution by a user.



AF/1751

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FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$155.00)

Complete if Known

Application Number	08/865,419
Filing Date	05/28/1997
First Named Inventor	AUGER
Examiner Name	C. Liott
Group Art Unit	1751
Attorney Docket No.	

#35
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6-2-01

METHOD OF PAYMENT

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number
Deposit Account Name

☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
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106	320	206	160	Design filing fee	<input type="text"/>
107	490	207	245	Plant filing fee	<input type="text"/>
108	710	208	355	Reissue filing fee	<input type="text"/>
114	150	214	75	Provisional filing fee	<input type="text"/>

SUBTOTAL (1) (\$)

2. EXTRA CLAIM FEES

	Extra Claims	Fee from below	Fee Paid
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Independent Claims	<input type="text"/> -3** = <input type="text"/>	X <input type="text"/>	= <input type="text"/>
Multiple Dependent	<input type="text"/>	= <input type="text"/>	= <input type="text"/>

Large Entity		Small Entity		Fee Description
Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim, if not paid
109	80	209	40	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
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105	130	205	65	Surcharge - late filing fee or oath	<input type="text"/>
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	<input type="text"/>
139	130	139	130	Non-English specification	<input type="text"/>
147	2,520	147	2,520	For filing a request for ex parte reexamination	<input type="text"/>
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	<input type="text"/>
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	<input type="text"/>
115	110	215	55	Extension for reply within first month	<input type="text"/>
116	390	216	195	Extension for reply within second month	<input type="text"/>
117	890	217	445	Extension for reply within third month	<input type="text"/>
118	1,390	218	695	Extension for reply within fourth month	<input type="text"/>
128	1,890	228	945	Extension for reply within fifth month	<input type="text"/>
119	310	219	155	Notice of Appeal	<input type="text"/>
120	310	220	155	Filing a brief in support of an appeal	155
121	270	221	135	Request for oral hearing	<input type="text"/>
138	1,510	138	1,510	Petition to institute a public use proceeding	<input type="text"/>
140	110	240	55	Petition to revive - unavoidable	<input type="text"/>
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142	1,240	242	620	Utility issue fee (or reissue)	<input type="text"/>
143	440	243	220	Design issue fee	<input type="text"/>
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123	50	123	50	Petitions related to provisional applications	<input type="text"/>
126	240	126	240	Submission of Information Disclosure Stmt	<input type="text"/>
581	40	581	40	Recording each patent assignment per property (times number of properties)	<input type="text"/>
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169	900	169	900	Request for expedited examination of a design application	<input type="text"/>

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$155.00)

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Signature

Date 06/18/2001

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